Resin CoasterCreation

Learn how to make One-Part Molds for epoxy resin using basic materials by creating a set of coasters in the SILab. Workshop being Taught Friday, June 3, from 1-3pm.

Introduction/Notes

- A One Part Mold is a mold where you only have to make one side of the mold in order to get the final project desired. This can also be called a relief mold.
- The molds we are making are going to be "negative molds," meaning that we are going to be building the space around the model so that the part we fill with resin will be the "positive." This is because our end goal is the resin coaster.
- The steps here can also translate to other materials (silicon or plaster for example) but the materials used might need to be adjusted to be sure they can stand the heat some of the other mold making materials generate.
- Packing tape is going to be used a lot during this workshop because it is clear so it lets you see what was drawn underneath it but is also a much less porous material than the cardboard and paper so the resin won't be able to soak into it as easily.

Supplies Needed

- > Paper
- Pen/Pencil
- Cardboard
- > Ruler
- Protractor
- Circle Guide
- Middle Insert (Optional)
- Packing Tape
- Masking Tape
- Gloves

- Hot Glue Gun and Glue
- Box Cutter
- Flat Head
 Screwdriver
- Paper Cups
- Glitter Dust
- Epoxy Resin parts A and B
- Heat Gun/Lighter
- Mold Release Spray
- Small Scale





Draw the Middle of the Coasters

Using the triangular guide with the circle in the middle, draw out where you want the middle of your coasters to be on your paper. Make sure you leave room around the edges for you to put the outer walls of the mold. During this stage also be sure to write your name and email on your paper so that we know who the finished coasters belong to.



Center Point of the Inner Circle

After drawing the inner circles, you'll want to find the center point so you can be sure the cup slot is right in the middle of the coaster. To do this you can lay the ruler down over the circle at its widest points (the middle circle is 3 inches in diameter) and measure in to the center in 2 directions.



Draw the Outer Shape of the Coasters

Using a ruler, a protractor, or free-hand, draw the outer edge of the coasters. The example coasters go $\frac{1}{2}$ an inch out from the inner circle in any given direction.



Tape Over Designs

Once you are happy with what will be the outlines for your coaster, use packing tape to cover the paper. Be sure the packing tape overlaps by at least 1/8 of an inch and is fully flattened/with minimal air bubbles.



Diameter * π = Circumference

Circumference

If you chose to make circular coasters, then to figure out how long to make the cardboard for the walls, you'll need to get the circumference of the circle. Find the diameter using a similar method to how you found the center of the inner circle, then multiply that by pi (3.14) and that will give you the circumference. Make sure your cardboard is at least an inch longer than the circumference.



Measure and Draw the Outer Walls

Grab a piece of cardboard that is at least 1 inch longer than the circumference of the outer wall, you want to make sure the corrugations are perpendicular to your lines. Once you have the cardboard, measure out a few lines $\frac{1}{2}$ an inch apart.



Tape Over Lines

After drawing out your lines, tape over both sides of the cardboard, again make sure the tape overlaps at least 1/8 an inch and is as smooth as possible.



Cut Out the Strips

After taping everything, cut out the strips of cardboard following the lines drawn. It can be helpful to do multiple shallow passes with the blade for greater control and/or to use a ruler to help guide the knife as you cut.



Cut to Length

Once you have the strips cut, cut off the ends of the cardboard where so you have a piece that is only 1 inch longer than the circumference of the outer wall. This step may not be necessary if your original piece of cardboard was already the right length.



Squish the Cardboard Corrugations

Using your hands, squish the corrugations down so the cardboard is both flatter and more flexible. This will make it easier to get clean edges in the mold, especially if the mold is going to have any curved sides.



Glue the Inner Circle

If you want the coaster to have a spot in the middle for the glass to rest, then you will need to glue down the cardboard insert (provided/premade). Following the inner circle outline you drew earlier, add hot glue to your paper. If you get a good border/rim of glue it will make removing the insert at the end easier.



Smooth Out Glue

Because we are making molds, any bumps or texture on the paper will show up in the final coaster. To end up with a cleaner model, it can be helpful to smooth out the hot glue, so while the glue is still warm, take a flat head screwdriver and smooth/flatten any extra glue. Be sure not to pull too much glue away because you still want the disc to be solidly attached to the paper.



Glue the Walls Down

After gluing the center discs in place, you can start gluing down the outer walls. Start with just gluing down a small section to secure the cardboard strip to the paper.



Gluing the Walls Down

Now that the cardboard is first attached, continue gluing down the wall in $\frac{1}{2}$ to 1 inch long stretches. I find it helpful to glue, then hold the cardboard in the shape of the curve for 15 seconds to make sure the part sets in place.



Smooth Out Glue

Like with the middle circles, it can be helpful to take a flathead screwdriver and smooth out the glue on the outer walls. Do this after holding the walls in place and carefully as there is a lot more of a chance for the walls to shift in place than there was with the center disc.



Sealing the Edge

When it is time to glue the final edges down/close the shape of the outer wall, make sure to really glue the seam shut on both sides of the cardboard strip. I also find it helpful to glue the tail of extra cardboard down to the paper to give more stability to the connection/shape.



Tape to a Level Surface (Cardboard)

Once the parts of the model are all glued to the paper, tape the page with masking tape to a level surface, here a piece of cardboard. This will allow for more flexibility when it comes to the next stages as the model will be more rigid than it was when it was just a base of paper.



Gloves Required for Next Steps

Before doing any of the next steps, be sure to put on a pair of gloves. There is also the option to put on a plastic apron if you think you might get resin on your clothing and would like to avoid that.



Spray Mold Release

Once the molds are taped to their stiff base, take the whole structure outside (with a tarp!) and spray mold release onto both molds. Spray from at least 12 inches away, pause for a minute to let the first layer of spray set, then spray again. After the second spray, bring the mold inside; the spray does need to set again before pouring the epoxy into it but it will set while the epoxy is being prepared.



Prepare to Mix Resin

If you are making 2 different colored coasters, grab 2 smaller cups for this process, otherwise grab one medium cup. Place your (first) cup on the scale and press the Power/Tare button to "zero" the scale to ignore the weight of the cup.



Pour Part A

Pour Resin Part A into your cup. If you are planning on both coasters being the same color, pour until you are at the 1 color amount weight. If you want the coasters to be different colors, pour until you get to the 2 color amount weight.



Pour Part B

Pour Resin Part B into your cup. If you are planning on both coasters being the same color, pour until you are at the 1 color amount weight. If you want the coasters to be different colors, pour until you get to the 2 color amount weight. You essentially want to double the weight as this particular resin is a 1:1 mixture.



Mix

After pouring both parts, remove the cup from the scale and stir the mixture with a popsicle stick for at least a minute or until fully combined. Be sure to both move the stick up and down in the cup and scrape the edges and bottom of the cup to make sure that all the liquid is mixed.



Add Glitter/Color

Unless you want the coasters to be clear, add in a small amount of the glitter powder color of your choosing to the resin. A little goes a long way with the fine powder we have. If you don't have glitter (or don't like glitter) then you can use alcohol based inks/paints as well to add color, just don't add too much or the resin will never set/harden.



Mix in the Glitter/Color

Once all the glitter has been poured in and the glitter bag sealed shut again, stir the glitter into the resin. Stirring for a minute will generally be enough to get it fully incorporated into the resin mixture.



Pour the Resin

Once you are happy with the color, pour the resin into the mold(s). For more complex molds it can be helpful to brush the resin into the cracks first to make sure it will fill the whole mold but for these that won't be necessary.



Pop Air Bubbles

After pouring, there will likely be air bubbles in your resin. To get rid of them, first lift and drop the mold on the table to tap the air bubbles to the top. Then take a heat gun or lighter and carefully use the heat to pop the air bubbles. You may need to repeat this process a few times to get all of the air bubbles out, just be careful not to burn the tape or yourself.



Let the Resin Set

Let the resin set, this particular resin needs to set for 72 hours, ideally in a place where it won't get too much dust or debris in it (here we will be covering them with either cardboard or a tarp to protect them).



Popping the Coasters Out

After 72 hours have passed, the coasters can be removed from the mold. In this case that means removing the paper from the cardboard base, then pulling the cardboard walls off of the paper and pulling the mold out.



Removing the Middle Disc

If you decided to have the middle of the coaster have the indent, then you will need to remove the disc of cardboard at the end. This can be best done using a pair of pliers and carefully pulling. The cardboard might come apart in chunks attached by the tape.



Finishing Touches

After the coasters are removed from their molds, they can be sanded down if desired to get smoother edges, both on the outside and the inside ring of the coaster. Resin can be sanded either by hand, using the Dremel tools, or using the belt/disc sander. If after sanding you want to restore the shine of the finished resin, you can either do a second small batch and brush it on or you can spray a layer of glossy spray paint on it to finish it.



Photograph and Enjoy!

After getting the coasters to look how you want, take some pictures of your finished coasters! Then take them home and enjoy them or gift them to others.